



#4

## SEQUENCE LISTING

<110> Quint, Wilhelmus  
Van Doorn, Leendert

<120> PROBES, METHODS AND KITS FOR DETECTION  
AND TYPING OF HELICOBACTER PYLORI NUCLEIC ACIDS IN  
BIOLOGICAL SAMPLES

<130> INNOG2.001C1

<140> 10/035,978

<141> 2001-12-21

<150> 09/284,725

<151> 1999-04-16

<150> EP 97870133.2

<151> 1997-09-09

<150> EP 96870131.8

<151> 1996-10-16

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<223> HpdiaS3 vacA-derived probe

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23

<210> 38

<211> 23

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<223> HpdiaS4 vacA-derived probe

<400> 38

catgccgcct tttttacaac cgt

23

<210> 39

<211> 23

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<223> HpdiaS5 vacA-derived probe

<400> 39

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23

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cgctgtagga acggtctcag ggcttcttag ttggggacta aaacaagccg aagaagccaa 180  
taaa 184

<210> 41

<211> 199

<212> DNA

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<221> misc\_feature

<222> 10, 30, 37, 58, 85, 112

<223> n = A,T,C or G

<400> 41

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tcatgccgcc tttttcaciaa ccgtnatcat tccagccatt gttgggggta tngctacagg 120  
caccgctgta ggaacgggtct caggggttct tagttgggga ctaaaacaag ccgaagaagc 180  
caataaaaacc ccagataaa 199



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aggcactgct gtaggaacgg tctcagggct tcttagttgg ggrctcaaac aagccgaaga 180  
agcsaataaa accccrgata aaccgataa agtttggcgc attcaag 227

<210> 43  
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atgccgcctt tttcacaacc gtgatcattc cagccattgt tggaggtatc gctacaggtg 120  
ctgctgtagg aacgggtctca gggcttcttg gttggggggct caaacaagcc gaagaa 176

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atgccgcctt tttcacaacc gtgatcattc cagccattgt tggaggtatc gctacaggcg 120  
ctgctgtagg aacgggtctca gggcttctta gctggggggct caaacaagcc gaagaagcca 180  
ataaa 185

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<220>  
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agtcacgccg ctttttttac aaccgtgatc attccagcca ttgttggagg tatcgctaca 120  
ggcgtgctg taggaacggc ctcagggctt cttagctggg ggctcaaaca agccgaacaa 180  
gccaataaag ccccgacaa accc 204

<210> 46  
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<223> Helicobacter pylori vacA nucleic acid sequence

<400> 46

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aggcgctgct gtaggaacgg ttccagggtc tcttggtctg gggctaaaac aagccgaaga 180
agccaataaa accccagata aaccgca 207
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<210> 47

<211> 207

<212> DNA

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<223> Helicobacter pylori vacA nucleic acid sequence

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aggcgctgct gtaggaacgg tctcagggtc tcttagctgg gggctcaaac aagccgaaga 180
agccaataaa accccggaca aaccgca 207
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<212> DNA

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<223> Helicobacter pylori vacA nucleic acid sequence

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aggcgctgct gtaggaacgg tctcagggtc tcttagctgg gggctcaaac aagccgaaga 180
agccaataaa accccagata aaccgca 207
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<223> Helicobacter pylori vacA nucleic acid sequence

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cgctgtagga acggtttcag ggcttcttag ctgggggctc aaacaagccg aagaag 176
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<212> DNA

<213> Artificial Sequence

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<223> Helicobacter pylori vacA nucleic acid sequence

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taaagcc 187

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<211> 193  
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ctgtaggaac ggtttcaggg cttcttagct gggggctcaa acaagccgaa gaagccaata 180  
aaacccaga taa 193

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ccgctgtagg aacggtttca gggcttctta gctgggggct caaacaagcc gaacaagcca 180  
ataaagcccc ggacaa 196

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<222> 87, 106, 107, 108, 109  
<223> n = A,T,C or G

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ggcaccgctg t 131

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ggcgctgctg taggaacggt ctcagggctt cttagttggg gactcaaaca agccgaagaa 180  
gcgaa 185

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<221> misc\_feature  
<222> 87, 143, 165  
<223> n = A,T,C or G

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ggcaccgctg taggaacggt ctnagggtt yttagttggg gactnwaaca agccgaagaa 180  
gccaataaaa ccccgataa a 201

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<221> misc\_feature  
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<223> n = A,T,C or G

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tgctgtagga acggtctcag ggcttcttag ctgggggctc aaacaagccg aacaagccaa 180  
taaagcc 187

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taaaacc 187

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 <222> 27, 34, 53, 55, 76, 82, 160  
 <223> n = A,T,C or G

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 cgctgtagga acggtctcag ggcttcttag ttggggactn aaacaagccg aagaagcgaa 180  
 taaaa 185

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 aaagtttggc gcattcaag 199

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 cagataaa 188

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aggcaccgct gtaggaacgg tctcagggct tcttagttgg ggactcaaac aagccgaaga 180  
agcgaataaa accccagtat aaaccc 206

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<221> misc\_feature  
<222> 143, 165  
<223> n = A,T,C or G

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aggcgctgct gtaggaacgg ttctagggct tcttagctgg gggctcaaac aagccgaaca 180  
agccaataaa gccccg 196

<210> 69  
<211> 196  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 69  
tagtgggggc attaatgagt accgaactag gggctaacac gccaaatgat ccatacacaca 60  
gcgagagtcg cgccctttttt acaaccgtga tcattccagc cattgttggg ggtatcgcta 120  
caggcgctgc tgtaggaacg gtctcagggc ttcttagctg ggggctcaaa caagccgaac 180  
aagccaataa agcccc 196

<210> 70  
<211> 232  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 70  
caatcgccct attatctctc tcgctctagt gggggtgtta atgggtaccg aactaggggc 60  
taacacgcca aacgatccca tacacagcga gagtcgcgcc ttttttacaa ccgtgatcat 120  
tccagccatt gttgggggta tcgctacagg cgctgctgta ggaacgggtt cagggtttct 180  
tagctggggg ctcaaacaag ccgaacaagc caataaagcc ccgacaaaac cc 232

<210> 71  
<211> 228  
<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 71

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aatcgcccta ttatctctct cgctctagt ggggtgttaa tgggtaccga actaggggct 60
aacacgccaa acgatcccat acacagcgag agtcgcgcct ttttcacaac cgtgatcatt 120
ccagccattg ttggaggtat cgctacaggt gctgctgtag gaacgggtctc agggcttctt 180
agctggggggc tcaaacaagc cgaacaagcc aataaagccc cggacaaa 228
```

<210> 72

<211> 228

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 72

```
aatcgcccta ttatctctct cgctttagtg ggggttrtta tgggcaccga actaggggct 60
aacacgccaa acgatcccat acacagcgag agtcgcgcct ttttcacaac cgtgatcatt 120
ccagccattg ttgggggtat cgctacaggc gctgctgtag gaacgggtctc agggcttctt 180
agctggggggc tcaaacaagc cgaacaagcc aataaagccc cggataaa 228
```

<210> 73

<211> 233

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 73

```
aatcgcccta ttatctctct cgctttagag ggggtgttaa taggcaccga actaggggct 60
aacacgccaa atgatcccat acacagcgag agtcgcgcct tttttacaac cgttattatt 120
ccagccattg ttgggggtat cgctacaggc gctgctgtag gaacgggtctc agggcttctt 180
agctggggggc tcaaacaagc cgaacaagcc aataaagccc cggataaacc cga 233
```

<210> 74

<211> 300

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 74

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tttaaagggt gatgctcata cagctaattt taaagggtatt gatacgggta atgggtggttt 60
caacacctta gatttttagtg gtgttacagg taagggtcaat atcaacaagc tcatcacagc 120
ttccactaat gtggccggtta aaaacttcaa cattaatgaa ttgattgtta aaaccaatgg 180
tgtgagtgtg ggggaataca ctcatcttag cgaagatata ggcagtcaat cgcgcaccaa 240
taccgtgcgt ttggaaactg gcactaggtc aatcttttct gggggtgtta aatttaaagg 300
```

<210> 75

<211> 300

<212> DNA

<213> Artificial Sequence

<220>



<223> Helicobacter pylori vacA nucleic acid sequence

<400> 75

```
tttaaagggtg gatgctcata cagctaattt taaagggtatt gatacgggta atgggtggttt 60
caacacctta gatttttagtg gtgttacagg taagggtcaat atcaacaagc tcattacggc 120
ttccactaat gtggccgcta aaaacttcaa cattaatgaa ttgttggtta agaccaatgg 180
ggtgagtgtg ggggaatata ctcatttttag cgaagatata ggcagtcaat cgcgcatcaa 240
taccgtgcgt ttggaaactg gcactaggtc aatcttttct ggggggtgtca aatttaaagg 300
```

<210> 76

<211> 300

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 76

```
tttaaaagtg gatgctcata cagctaattt taaagggtatt gatacgggta atgggtggttt 60
caacaccttg gatttttagtg gcgttacaga caaagtcaat atcaacaagc tcatcacagc 120
ttccactaat gtggccatta aaaacttcaa cattaatgaa ttgttggtta agaccaatgg 180
ggtgagtgtg ggggaatata ctcatttttag cgaagatata ggcagtcaat cgcgcatcaa 240
caccgtgcgt ttagaaactg gcactaggtc aatcttttct ggggggtgtca aatttaaaag 300
```

<210> 77

<211> 300

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 77

```
tttaaagggtg gatgctcata cagctaattt taaagggtatt gatacgggta atgggtggttt 60
caacacctta gatttttagtg gtgttacagg taagggtcaat atcaacaagc tcatcacagc 120
ttccactaat gtggccgcta aaaacttcaa cattaatgaa ttgattgtta aaaccaatgg 180
ggtgagtgtg ggggaatata ctcatttttag cgaagatata ggcagtcaat cgcgcatcaa 240
taccgtgcgt ttggaaactg gcactaggtc aatctattct ggcggtgtta aatttaaagg 300
```

<210> 78

<211> 300

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 78

```
tttaaaagtg gatgctcata cagctaattt taaagggtatt gatacgggta atgggtggttt 60
caacacctta gatttttagtg gtgttacagg taagggtcaat atcaacaagc tcatcacagc 120
ttccactaat gtggccgcta aaaacttcaa cattaatgaa ttgattgtta aaaccaatgg 180
ggtgagtgtg ggggaatata ctcatttttag cgaagatata ggcagtcaat cgcgcatcaa 240
taccgtgcgt ttggaaactg gcactaggtc aatctattct ggcggtgtta aatttaaagg 300
```

<210> 79

<211> 300

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 79

```
tttaaaagtg gatgctcata cagctaattt taaaggtatt gatactggta atggtgggtt 60
caacacctta gatttttagt gtgttacaaa caaagtcaat atcaacaagc tcattacagc 120
ttccactaat gtggccgtta aaaacttcaa cattaatgaa ttgttgggta agattaatgg 180
ggtgagtgtg ggggaatata cttattttag cgaagatata ggcagtcaat cgcgcatcaa 240
caccgtgcgt ttggaaactg gcactaggtc aatctattct ggcggtgtta aatttaaagg 300
```

<210> 80

<211> 300

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 80

```
tttaaagggt gatgctcata cagctaattt taaaggtatt gatacgggta atggtgggtt 60
caacacctta gatttttagt gtgttacagg taagggtcaat atcaacaagc tcatcacggc 120
ttccactaat gtggccgtta aaaacaacaa cattaatgaa ttggtgggta aaaccaatgg 180
gataagtgtg ggggaatata ctcattttag cgaagatata ggcagtcaat cgcgcatcaa 240
taccgtgcgt ttggaaacag gcactaggtc aatcttttct ggggggtgtca aatttaaaag 300
```

<210> 81

<211> 300

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 81

```
tttaaaagtg gatgctcata cagctaattt taaaggtatt gatacgggta atggtgggtt 60
caacacctta gatttttagt gtgttacagg taagggtcaat atcaacaagc tcattacggc 120
ttccactaat gtagccgtta aaaacttcaa cattaatgaa ttgttgggta agaccaatgg 180
ggtgagtgtg ggggaatata ctcattttag cgaagatata ggcagtcaat cgcgcatcaa 240
caccgtgcgt ttggaaactg gcactaggtc aatcttttct ggggggtgtca aatttaaaag 300
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<210> 82

<211> 300

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 82

```
tttaaagggt gatgctcata cagctaattt taaaggtatt gatacgggta atggtgggtt 60
caacacctta gatttttagt gtgttacagg taagggtcaat atcaacaagc tcatcacagc 120
ttccactaat gtggccgtta aaaacttcaa cattaatgaa ttgattgtta aaaccaatgg 180
gataagtgtg ggggaatata ctcattttag cgaagatata ggaagtcaat cgcgcatcaa 240
taccgtgcgt ttggaaactg gcactagatc aatcttttct ggggggtgtta aatttaaagg 300
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<210> 83  
<211> 375  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 83  
tttaagagtg gacgctcata cagcttattt taatggcaat atttatctgg gaaaatccac 60  
gaatttaaga gtgaatggcc atagcgctca ttttaaaaat attgatgcca gcaagagcga 120  
taacgggcta aacactagcg ctttggattt cagcggcggt acagacaaag tcaatatcaa 180  
caagctcact acatctgcca ctaatgtgaa cgttaaaaac tttgacgtta aggaattggt 240  
ggttacaacc cgtgttcaga gttttgggca atacactatt tttggcgaaa atataggcga 300  
taagtctcgc attggtgtcg tgagtttgca aacgggatat agcccggcct attctggggg 360  
cgttactttt aaaag 375

<210> 84  
<211> 375  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 84  
cttaagagtg gatgctcata cagcttattt taatggcaat atttatttgg gaaaatccac 60  
gaatttaaga gtgaatggcc atagcgctca ttttaaaaat attgatgcca gtaagagcga 120  
taacgggcta aacactagtg ctttggattt tagcggcggt acagataaag tcaatatcaa 180  
caagctcact acatctgcca ctaatgtgaa cgttaaaaac tttgacatta aggaattggt 240  
ggttacaacc cgagttcaaa gttttgggca atacactatt tttggcgaaa atataggcga 300  
taagtctcgc attggtgtcg ttagtttgca aacgggatat agcccggcct attctggggg 360  
cgttactttt aaaag 375

<210> 85  
<211> 374  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 85  
tttaagagtg gatgctcata cagcttattt taatggcaat atttatctgg gaaaatccac 60  
gaatttaaga gtgaatggcc atagcgctca ttttaaaaat attgatgcca gtaagagcga 120  
taacgggcta aacactacca ctttggattt cagcggcggt acagataaag tcaatatcaa 180  
caagctcact acatctgcca ctaatgtgaa cattaaaaac tttgacatta aggaattagt 240  
ggttacaacc cgagttcaga gttttgggca atacactatt tttggcgaaa atataggcga 300  
taagctgcac attggtgtcg tgagtttgca aacgggatat agcccagcct attctggggg 360  
gcttactttt aaag 374

<210> 86  
<211> 375  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 86  
tttaagagtg gatgctcata cagcttattt taatggcaat atttatctgg gaaaatccac 60

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gaattttaaga gtgaatggcc atagcgctca ttttaaaaat attgatgcca gtaagagcga 120
taacggggcta aacactagct ctttggattt cagtggcggt acagacaaag tcaatatcaa 180
caagctcact acatctgcc aataatgtgaa cgttaaaaaac tttgacatta aggaattggg 240
ggttacaacc cgcgttcaga gttttgggca atacactatt tttggcgaaa atataggcga 300
taagtctcgc attggtgtcg ttagtttgca aacgggatat agcccggcct attctggggg 360
cgttactttt aaaag
375

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<210> 87  
 <211> 365  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Helicobacter pylori vacA nucleic acid sequence

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<400> 87
gatgctcata cagcttattt taatggcaat atttatctgg gaaaatccac gaattttaaga 60
gtgaatggcc atagcgctca ttttaaaaat attgatgcca gtaagagcga taacggggcta 120
aacactagcg ctttggattt yagcggcggt acagayaaag tcaatatcaa caagctcact 180
acatctgcc aataatgtgaa cgttaaaaaac tttgacatta aggaattagt ggttacaacc 240
cgagttcaaa gttttgggca atacactatt tttggcgaaa atataggcga taagtctcgc 300
attggtgtcg ttagtttgca aacgggatat agcccggcct attctggggg cgttactttt 360
aaaag
375

```

<210> 88  
 <211> 375  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Helicobacter pylori vacA nucleic acid sequence

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<400> 88
tttaagaggg gatgctcata cagcttattt taatggcaat atttatttgg gaaaatccac 60
gaattttaaga gtgaatggcc atagcgctca ttttaaaaat attgatgcca gtaagagcga 120
taacggggcta aacactagcg ytttggattt tagcggcggt acagayaaag tcaatatcaa 180
caagctcact acatctgcc aataatgtgaa crttaaaaac tttgayatta aggaattggg 240
ggttacaacc cgagttcaaa gttttgggca atacactatt tttggcgaaa atataggcga 300
tmagtctcgc attggtgtcg ttagtttgca aacgggatat agcccr gcct attctggggg 360
cgttactttt aaaag
375

```

<210> 89  
 <211> 375  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Helicobacter pylori vacA nucleic acid sequence

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<400> 89
tttaagcgtg gatgctcata cagcttattt taatggtaat atttatctgg gaaaatccac 60
gaattttaaga gtgaatggcc atagcgctca ttttaaaaat attgatgcca caaagagcga 120
taacggggcta aacactagcg ctttggattt cagcggcggt acagataaag tcaatatcaa 180
caagctcact acatctgcc ctaacgtgaa cattaaaaaac tttgacatta aggaattggg 240
ggttacaacc cgagttcaaa gttttgggca atacactatt tttggcgaaa atataggcga 300
taagtctcgc attggtgtcg tgagtttgca aacgggatat agcccggcct attctggggg 360
cgttactttt aaaag
375

```

<210> 90  
 <211> 375  
 <212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 90

```
tttaagagtg gatgctcata cagcttattt taatggcaat atttatctgg gaaaatccac 60
gaatttaaaa gtgaatggcc atagcgctca ttttaaaaat attgatgcca gtaagagcga 120
taatgggtcta aacactagtg ctttggattt gagcggcggt acagacaaag tcaatatcaa 180
caagctcact acagctgcca ctaatgtgaa cattaataaac tttgacatta aggaattagt 240
ggttacgacc cgtgttcaga gttttgggca atacactatt tttggcgaaa atataggaga 300
tcaatcgcgc attggtgtcg ttagtttgca aactggctat agcccggcct attctggggg 360
cgttactttt aaaag 375
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<210> 91

<211> 375

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 91

```
cttaagagtg gatgctcata cagcttattt taatggcaat atttatctgg gaaaatccac 60
gaattttaa gaatggcc atagcgctca ttttaaaaat attgatgcta gtaagagcga 120
taacgggcta aacactagcg ctttggattt tagcggcggt acagacaaag tcaatatcaa 180
caagctcact acatctgcca ctaatgtgaa cattaataaac tttgacatta aggaattggg 240
ggttacaacc cgagttcaaa gttttgggca atacactatt tttggcgaaa atataggcga 300
taagtctcgc attggtgtcg tgagtttgca aacgggatat agcccggcct attctggggg 360
cgttactttt aaaag 375
```

<210> 92

<211> 449

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 92

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atgactaacg aaaccattaa ccaacaacca caaagcgaag cggcttttaa cccgcagcaa 60
tttatcaata atcttcaagt agcttttctt aaagttgata acgctgtcgc ttcatacgat 120
cctgatcaaa aaccaatcgt tgataagaac gatagggata ataggcaagc ttttgatgga 180
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt cagactttat caataagagc aatgatttaa tcaacaaaga cgctctcatt 300
gatgtagaat cttccacaaa gagctttcag aaatttgagg atcagcggtt ccgaattttc 360
acaagttggg tgtcccatca aaacgatccg tctaaaatca acaccgatc gatccgaaat 420
tttatggaaa atatcatata accccctat 449
```

<210> 93

<211> 449

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 93

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atgactaacg aaaccattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60
tttatcaata atcttcaagt agcttttctt aaagttgata acgctgtcgc ttcatacgat 120
cctgatcaaa aaccaatcgt tgataagaac gatagggata acaggcaagc ttttgatgga 180
```

```

atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt cagactttat caataagagc aatgatttaa tcaacaaaga cgctctcatt 300
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcggtta ccgaattttc 360
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420
tttatggaaa atatcatata accccctat 449

```

```

<210> 94
<211> 449
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Helicobacter pylori cagA nucleic acid sequence

```

```

<400> 94
atggctaacg aaactattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60
tttatcaata atcttcaagt agcttttctt aaagttgata acgctgtcgc ttcatacgat 120
cctgatcaaaa aaccaatcgt tgataagaac gatagggata acaggcaagc ttttgatgga 180
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt cagactttat caataagagc aatgatttaa tcaacaaaga cgctctcatt 300
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcggtta ccgaattttc 360
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420
tttatggaaa atatcatata accccctat 449

```

```

<210> 95
<211> 449
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Helicobacter pylori cagA nucleic acid sequence

```

```

<400> 95
atgactaacg aaaccattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60
tttatcaata atcttcaagt ggcttttctt aaagttgata acgctgtcgc ttcatacgat 120
cctgatcaaaa aaccaatcgt tgataagaac gatagggata ataggcaagc ttttgatgga 180
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt cagactttat caataagagc aatgatttaa tcaacaaaga cgctctcatt 300
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcggtta ccgaattttc 360
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420
ttcatggaaa atatcatata accccctat 449

```

```

<210> 96
<211> 449
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Helicobacter pylori cagA nucleic acid sequence

```

```

<400> 96
atgactaacg aaaccattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60
tttatcaata atcttcaagt ggcttttctt aaagttgata acgctgtcgc ttcatacgat 120
cctgatcaaaa aaccaatcgt tgataagaac gatagggata acaggcaagc ttttgatgga 180
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt caaactttat caataagagc aatgatctaa tcaacaaaga caatctcatt 300
gatgtagaat cttccaaaaa gagctttcag aaatttgggg atcagcggtta ccgaattttc 360
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420
tttatggaaa atatcatata accccctat 449

```

```

<210> 97

```

<211> 449  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori cagA nucleic acid sequence

<400> 97  
atgactaacg aaaccattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60  
tttatcaata atcttcaagt agcttttctt aaagttgata acgctgtcgc ttcatacgat 120  
cctgaccaaa aaccaatcgt tgataagaac gatagggata acaggcaagc ttttgataga 180  
atctcacaat taagggagga atactccaat aaagcgatca aaaatcctac caaaaagaat 240  
cagtattttt cagactttat cgataagagc aacgatttaa tcaacaaaga cgctctcatt 300  
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcgta ccgaattttc 360  
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420  
tttatggaaa atatcatata accccctat 449

<210> 98  
<211> 449  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori cagA nucleic acid sequence

<400> 98  
atgactaacg aaaccattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60  
tttatcaata atcttcaagt ggcttttctt aaagttgata acgctgtcgc ttcatacgat 120  
cctgatcaaa aaccaattat tgataagaac gatagggata acaggcaagc ttttgatgga 180  
atctcgcaat taagggaaga atattccaat aaagcgatca aaaatcctac caaaaagaat 240  
cagtattttt cagactttat cgataagagc aatgatttaa tcaacaaaga caatctcatt 300  
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcgta ccgaattttc 360  
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420  
tttatggaaa atatcatata accccctat 449

<210> 99  
<211> 449  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori cagA nucleic acid sequence

<400> 99  
atgactaacg aaaccattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60  
tttatcaata atcttcaagt agcttttctt aaagttgata atgctgtcgc ttcatacgat 120  
tctgatcaaa aaccaatcat tgataagaac gatagggata acaggcaagc ttttgataga 180  
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240  
cagtattttt cagactttat cgataagagc aacgatttaa tcaacaaaga caatctcatt 300  
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcgta ccgaattttc 360  
acaagttggg tgtcccatca aaatgatccg tctaaaatca acacccgatc gatccgaaat 420  
tttatggaaa atatcatata accccctat 449

<210> 100  
<211> 449  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori cagA nucleic acid sequence

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<400> 100
atgactaacg aaactattga ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60
tttattaata atcttcaggt agcttttctt aagcttgata acgctgtcgc ttcatttgat 120
cctgatcaaa aaccaatcgt tgataagaat gatagggata acaggcaagc ttttgatgga 180
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt cagactttat caataagagc aatgatttaa tcaacaaaga cgctctcatt 300
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcggtta ccgaattttc 360
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccaaaat 420
tttatggaaa atatcatata accccctat                                     449

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<210> 101
<211> 449
<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori cagA nucleic acid sequence

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<400> 101
atgactaacg aaactattga ccaacaacca caaactgaag cggcttttaa cccgcagcaa 60
tttatcaata atcttcaagt ggcttttctt aagcttgata acgctgtcgc ttcatttgat 120
cctgatcaaa aaccaatcgt tgataagaac gatagggata acaggcaagc ttttgatgga 180
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt cagactttat caataagagc aatgatttaa tcaacaaaga cgctctcatt 300
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcggtta ccgaattttc 360
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaaat 420
tttatggaaa atatcatata accccctat                                     449

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<210> 102
<211> 449
<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori cagA nucleic acid sequence

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<400> 102
atgactaacg aaactattaa ccaacagcca caaaccgaag cggcttttaa cccgcagcaa 60
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cctgatcaaa aaccaatcgt tgataagaac gatagggata ataggcaggc ttttgatgga 180
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt cagactttat caataagagc aatgatttaa tcaacaaaga caatctcatt 300
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcggtta ccgaattttc 360
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaaat 420
tttatggaaa atatcatata accccctat                                     449

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<210> 103
<211> 449
<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori cagA nucleic acid sequence

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<400> 103
atgactaacg aaaccattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60
tttatcaata atcttcaagt ggcttttctt aagcttgata atgctgttgc ttcatttgat 120
cctgatcaaa aaccaatcgt tgataagaac gatagggata acaggcaagc ttttgatgga 180
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240
cagtattttt cagactttat cgataagagc aacgatttaa tcaacaaaga caatctcatt 300
gatgtagaat cttccacaaa gagctttcag aaatttgggg atcagcggtta ccgaattttc 360

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acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420  
tttatggaaa atatcatata accccctat 449

<210> 104  
<211> 449  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori cagA nucleic acid sequence

<400> 104  
atgactaacg aaaccattaa ccaacaacca caaaccgaag cggcttttaa cccgcagcaa 60  
tttatcaata atcttcaagt ggcttttctt aaagttgata acgtgtcgc ttcatacgat 120  
cctgatcaaa aaccaatcgt tgataagaac gatagggata ataggcaagc ttttgatgga 180  
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctac caaaaagaat 240  
cagtattttt cagactttat caataagagc aatgatttta tcaacaaaga cgctctcatt 300  
gatgtagaat cttccacaaa gagctttcag aaattttggg atcagcgta ccgaattttc 360  
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420  
ttcatggaaa atatcatata accccctat 449

<210> 105  
<211> 449  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori cagA nucleic acid sequence

<400> 105  
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tttatcaata atcttcaagt agcttttctt aaagttgata acgttgcgc ttcatttgat 120  
cctaataaaa aaccaatcgt tgataagaac gatagggata acaggcaagc ttttgatgga 180  
atctcgcaat taagggaaga atactccaat aaagcgatca aaaatcctgc caaaaagaat 240  
cagtattttt cagactttat caataagagc aatgatctta tcaacaaaga caatctcatt 300  
gatgtagaat cttccacaaa gagctttcag aaattttggg atcagcgta ccaaattttc 360  
acaagttggg tgtcccatca aaacgatccg tctaaaatca acacccgatc gatccgaaat 420  
tttatggaaa atatcatata accccctat 449

<210> 106  
<211> 449  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori cagA nucleic acid sequence

<400> 106  
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tttatcaata atcttcaagt ggcttttatt aaagttgata atgttgcgc ttcatttgat 120  
cctgatcaaa aaccaatcgt tgataagaat gatagggata ataggcaagc ttttgagaaa 180  
atctcgagc taaggaggga attcgcta ataaagcgatca aaaatcctgc caaaaagaat 240  
cagtattttt caagctttat cagtaagagc agtgatttaa tcaacaaaga cagtctcatt 300  
gatacagggt cttccataaa gagctttcag aaattttgga ctcagcgta ccaaattttt 360  
atgaattggg tgtcccatca aaaagatcca tctaaaatca acacccaaaa aatccgaggt 420  
tttatggaaa atatcatata accccctat 449

<210> 107  
<211> 464  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 107

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atgactaacg aaactattga tcaaacaaga acaccagacc aaacacaaag ccaaacagct 60
tttgatccgc aacaatttat caataatatt caagtggctt ttcttaaagt tgataacgct 120
gtcgtttcat ttgatcctga tcaaaaacca atcgttgata agaatgatag ggataacagg 180
caagcttttg agaaaatctc gcagctaagg gaggaattcg ctaataaagc gatcaaaaat 240
cctgccaaaa agaatacagta tttttcaagc tttatcagta agagcagtga tttagtcaac 300
aaagacagtc tcattgatac aggttcttcc ataaagagct ttcagaaatt tgggactcag 360
cgttacccaaa tttttatgaa ttgggtgtcc catcaaaaag atccatctaa aatcaacacc 420
caaaaaatcc aagattttat ggaaaatata atacaacccc ctat 464
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<210> 108

<211> 464

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 108

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tttgttccgc aacgatttat caataatctt caagtagctt ttattaaagt tgataacgct 120
gtctcttcat ttgatcctga tcaaaaacca atcgttgata agaatgatag ggataacagg 180
caagcttttg agaaaatctc gcaactaagg gaagaatacg ccaataaagc gatcaaaaat 240
cctgccaaaa agaatacagta tttttcagac tttatcaata agagcaatga tttgatcaac 300
aaagacaatc tcattgctgt agattcttcc gtagagacct ttaagaaatt tggggatcag 360
cgttacccaaa tttttacgaa ttgggtgtcc cttcaaaaag atccgtctaa aatcaacacc 420
cgacaaatcc gaaattttat ggaaaatata atacaacccc ctat 464
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<210> 109

<211> 464

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 109

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tttgttccgc aacgatttat caataatctt caagtagctt tccttaaagt tgatagcgct 120
gtcgtttcat ttgatcctga tcaaaaacca atcgttgata agaatgatag ggataacagg 180
caagcttttg agaaaatctc gcaactaagg gaagaatacg ccaataaagc gatcaaaaat 240
cctgccaaaa agaatacagta tttttcagac tttatcaata agagcaatga tttgatcaac 300
aaagacaatc tcattgctgt agattcttct gtagagagct ttaagaaatt tggggatcag 360
cgttacccaaa tttttacgag ttgggtgtcc cttcaaaaag atccgtctca aatcaacacc 420
cgacaaatcc gaaattttat ggaaaatata atacaacccc ctat 464
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<210> 110

<211> 464

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 110

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tttgttccgc aacgatttat caataatctt caagtagctt ttcttaaagt tgataacgct 120
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gtcgcttcat ttgatcctga tcaaaaacca atcgttgata agaatgatag ggataacagg 180
caagcttttg agaaaatctc gcaactaagg gaagaatacg ccaataaagc gatcaaaaat 240
cctgccaaaa agaatcagta tttttcagac tttatcaata agaccaatga tttgatcaac 300
aaagacaatc tcattgctgt agattcttcc gtagatagct ttaagaaatt tggggatcag 360
cgttaccaaa tttttacgag ttgggtgtcc cttcaaaaag atccgtctaa aatcaacacc 420
caacaaatcc gaaattttat ggaaaatata atacaacccc ctat 464

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<210> 111

<211> 464

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 111

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atgactaacg aaaccattga tcaacaaca acaccagatc aaacaccaa tcaaacagat 60
tttgttccgc aacgatttat caataatctt caagtagctt ttattaaagt tgatgacgct 120
gtcgcttcat ttgatcccgga tcaaaaacca atcgttgata agaatgatag ggataacagg 180
caagcttttg agaaaatctc gcaactaagg gaagaatacg ccaataaagc gatcaaaaat 240
cccacaaaaa agaatcagta tttttcagac tttatcaata agaccaatga tttgatcaac 300
aaagacaatc tcattgctgt agattcttcc gtagagagct ttaagaaatt tggggatcag 360
cgttaccaaa tttttacgag ttgggtgtcc cttcaaaaag atccgtctaa aatcaacacc 420
caacaaatcc gaaattttat ggaaaatata atacaacccc ctat 464

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<210> 112

<211> 464

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 112

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atgactaacg aaaccattga tcaacaaca acaccagatc aaacaccaa tcaaacagat 60
tttgttccgc aacgatttat caataatctt caagtagctt ttattaaagt tgataacgct 120
gttgcttcat ttgatcccgga tcaaaaacca atcgttgata agaatgatag ggataacagg 180
caagcttttg agaaaatctc gcaactaagg gaagaatacg ccaataaagc gatcaaaaat 240
cctgccaaaa agaatcagta tttttcagac tttatcaata agagcaatga tttgatcaac 300
aaagacaatc tcattgctgt agattcttcc gtagatagct ttaagaaatt tggggatcag 360
cgttaccaaa tttttacgag ttgggtgtcc cttcaaaaag atccgtctca aatcaacacc 420
caacaaatcc aaaattttat ggaaaatata atacaacccc ctat 464

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<210> 113

<211> 464

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori cagA nucleic acid sequence

<400> 113

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atgactaacg aaaccattga tcaacaaca acaccagatc aaacactaaa ccaaacggat 60
tttgttccgc aacgatttat caataatctt caagtagctt ttattaaagt tgataacgct 120
gtcgctttat ttgatcccgga tcaaaaacca atcgttgata agaatgatag ggataacagg 180
caagcttttg agaaaatctc gcaactaagg gaagaatacg ccaataaagc gatcaaaaat 240
cccacaaaaa agaatcagta tttttcagac tttatcaata agagcaatga tttgatcaac 300
aaagacaatc tcattgctgt agattcttcc gtagatagct ttaagaaatt tggggatcag 360
cgttaccaaa tttttacgag ttgggtgtcc cttcaaaaag atccgtctca aatcaacacc 420
cgacaaatcc gaaattttat ggaaaatata atacaacccc ctat 464

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<210> 114  
<211> 464  
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<220>  
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gtcgtttcat ttgatcctga tcaaaaacca atcgttgata agaataatga ggataacagg 180  
caagcttttg agaaaatctc gcaattaagg gaagaatacg ccaataaagc gatcaaaaat 240  
cctgccaaaa agaatacagta ttttttagac tttatcaata agagcaatga tttgatcaac 300  
aaagacaatc tcattgctgt agattcttcc gtagatagct ttaagaaatt tggggatcag 360  
cgttaccaa tttttacgag ttgggtgtcc cttcaaaaag atccgtctaa aatcaacacc 420  
caacaaatcc gaaattttat ggaataatc atacaacccc ctat 464

<210> 115  
<211> 132  
<212> DNA  
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<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 115  
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gccaaacgat cccatacaca gcgagagtcg cgcctttttt acaaccgtga tcattccagc 120  
cattgttggg gg 132

<210> 116  
<211> 132  
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<220>  
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<400> 116  
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gccaaacgat cccatacaca gcgagagtcg cgcctttttt acaaccgtga tcattccagc 120  
cattgttggg gg 132

<210> 117  
<211> 132  
<212> DNA  
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<220>  
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<400> 117  
ccctattatc tctctcgctc tagtgggggt gttaatgggc accgaactag gggctaatac 60  
gccaaacgat cccatacaca gcgagagtcg cgcctttttt acaaccgtga tcattccagc 120  
cattgttggg gg 132

<210> 118  
<211> 132  
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<400> 118

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gccaaacgat ccatacaca gcgagagtcg cgcctttttc acaaccgtga tcattccagc 120
cattgttggg gg                                     132
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<210> 119

<211> 132

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 119

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gccaaacgat ccatacaca gcgagagtcg cgcctttttc acaaccgtga tcattccagc 120
cattgttggg gg                                     132
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<210> 120

<211> 132

<212> DNA

<213> Artificial Sequence

<220>

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<400> 120

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gccaaatgat ccatacaca gcgagagtcg cgcctttttc acaacygtga tcattccagc 120
cattgttggg gg                                     132
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<210> 121

<211> 132

<212> DNA

<213> Artificial Sequence

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<400> 121

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gccaaacgat ccatacaca gcgagagtcg cgcctttttc acaaccgtga tcattccagc 120
cattgttggg gg                                     132
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<210> 122

<211> 132

<212> DNA

<213> Artificial Sequence

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<223> Helicobacter pylori vacA nucleic acid sequence

<400> 122

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gccaaacgat ccatacaca gcgagagtcg cgcctttttt acaaccgtga tcattccagc 120
cattgttggg gg                                     132
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cattgttggg gg 132

<210> 124  
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<220>  
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<400> 124  
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cattgttggg gg 132

<210> 125  
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<220>  
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<400> 125  
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cattgttggg gg 132

<210> 126  
<211> 105  
<212> DNA  
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<220>  
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<400> 126  
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<210> 127  
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tgctgccttc tttacaaccg tgatcattcc agccattggt ggggg 105

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<210> 132  
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tgccgccttc tttacaaccg tgatcattcc agccattggt ggggg 105

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tgccgccttt ttcacaaccg tgatcattcc ggccattgtt gggggg 105

<210> 135  
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<210> 137  
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<400> 153

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<211> 105

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<221> misc\_feature

<222> 27, 34, 53, 55, 76, 82

<223> n = A,T,C or G

<400> 154

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<223> Helicobacter pylori vacA nucleic acid sequence

<400> 155

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<400> 156

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<212> DNA

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<223> Helicobacter pylori vacA nucleic acid sequence

<400> 157

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tgccgccttt ttcacaaccg tgatcattcc agcvattgtg gggag 105

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tgccgccttt ttcacgaccg tgatcattcc agccattggt gggggg 105

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tgccgccttt ttcacaaccg tgatcattcc arccattggt gggggg 105

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tgccgccttt ttcacaaccg taatcattcc agccattggt gggggg 105

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<221> misc\_feature  
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<223> n = A,T,C or G

<400> 169  
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tgccgccttt ttcacaaccg tgatcattcc agccattggt ggggg 105

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<221> misc\_feature  
<222> 26, 27  
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tgccgccttt tttacaaccg tgatcattcc agccattggt ggggg 105

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<211> 105  
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<220>  
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<221> misc\_feature  
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<223> n = A,T,C or G

<400> 176  
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<210> 177  
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<220>

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<400> 177

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<210> 178

<211> 105

<212> DNA

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<220>

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<210> 179

<211> 105

<212> DNA

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<210> 180

<211> 105

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<400> 180

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<210> 181

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tgccgccttt ttcacgaccg tgatcattcc agccattggt ggggg 105

<210> 183
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<210> 184
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<210> 185
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<212> DNA
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<210> 186
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<221> misc_feature
<222> 7, 27, 34, 55, 82
<223> n = A,T,C or G

<400> 186
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<210> 187
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<210> 193

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<400> 193

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<210> 194

<211> 362

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 194

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agagtgaatg gccatagcgc tcatttttaa aatattgatg ccacaaagag cgataacggg 120
ctaaacacta gcactttgga ttttagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttacg 240
accogtggtc agagttttgg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattggtg tcgttagttt gcaaactggc tatagcccgg cctattctgg gggcgttact 360
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<210> 195

<211> 362

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 195

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ctaaacacta gtgctttgga tttgagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttaca 240
accogtggtc agagttttgg gcaatacact atttttggcg aaaatatagg cgataagtcg 300
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<400> 196

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ctaaacacta gcgcttttga tttgagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt ggtgggttaca 240
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtcg 300
cgcattggtg tcgttagttt gcaaacggga tatagcccgg cctattcttg gggcgttact 362
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<210> 197

<211> 362

<212> DNA

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<223> Helicobacter pylori vacA nucleic acid sequence

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ctaaacacta gcgcttttga tttgagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt ggtgggttaca 240
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtcg 300
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<211> 362

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<223> Helicobacter pylori vacA nucleic acid sequence

<400> 198

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ctaaacacta gcgcttttga tttcagcggc gttacagata aagtcaatat caacaagctc 180
actacatctg ccactaacgt gaacattaaa aactttgaca ttaaggaatt ggtgggttaca 240
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtc 300
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<210> 199

<211> 362

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<223> Helicobacter pylori vacA nucleic acid sequence

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ctaaacacta gcacttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt ggtgggttaca 240
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgatcagtc 300
cgcattggtg tcgtgagttt gcaaacggga tatagcccgg cttattcttg gggcgttact 362
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agagtgaatg gccatagcgc tcatttttaa aatattgatg ctagtaagag cgataacggg 120  
ctaaacacta gcgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt ggtgggttaca 240  
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
cgcattggtg tcgtgagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360  
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<220>  
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<400> 201  
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<210> 202  
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ctaaacacta gtgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtgggttaca 240  
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
cgcattggtg tcgtgagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360  
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<210> 203  
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<212> DNA  
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<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

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ctaaacacta gtgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtgggttaca 240  
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
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agagtgaatg gccatagcgc tcattttaaa aatattgatg ccagcaagag cgataacggg 120  
ctaaacacta gtgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttaca 240  
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
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<212> DNA  
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<220>  
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ctaaacacta gtgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttaca 240  
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
cgcattggtg tcgtgagttt gcaaacggga tatagcccgg cctattcttg gggcgttact 360  
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<212> DNA  
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<220>  
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agagtgaatg gccatagcgc tcattttaaa aatattgatg ccacaaagag cgataacggg 120  
ctaaacacta gcgcttttga ttttagtggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttaca 240  
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
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<220>  
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ctaaacacta gtgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agttgttaca 240
acccgagttc aaagttttgg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattgggtg tcgttagttt gcaaacggga tatagcccag cctattcttg gggcgttact 360
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362

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<210> 208
<211> 362
<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori vacA nucleic acid sequence

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<400> 208
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aaagtgaatg gccatagcgc tcatttttaaa aatattgatg ccagtaagag cgataatggt 120
ctaaacacta gcgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttaca 240
acccgtgttc agagttttgg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattgggtg tcgttagttt gcaaatggga tatagcccgg cctattcttg gggcgttact 360
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362

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<210> 209
<211> 362
<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori vacA nucleic acid sequence

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<400> 209
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aaagtgaatg gccatagcgc tcatttttaaa aatattgatg ccagtaagag cgataacggg 120
ctaaacacta gcgcttttga tttgagcggc gttacagaca aagtcaatat caacaagctc 180
actacagctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt ggttgttacg 240
acccgtgttc agagttttgg acaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattgggtg tcgttagttt gcaaacggga tatagcccgg cttattcttg gggcgttact 360
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362

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<210> 210
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<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori vacA nucleic acid sequence

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<400> 210
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agggtgaatg gccatagcgc tcatttttaaa aatattgatg ccagtaagag cgataacggg 120
ctaaacacta gctcttttga tttcagtggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacgtttaa aactttgaca ttaaggaatt ggttggttaca 240
acccgagttc agagttttgg gcaatacact atttttggcg aaattatagg cgataagtct 300
cgcattgggtg tcgttagttt gcaaacggga tatagcccgg cctattcttg gggcgttact 360
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362

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<210> 211

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<211> 362  
<212> DNA  
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<220>  
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agagtgaatg gccatagcgc tcatttttaa aatattgatg ccagtaagag cgataacggg 120  
ctaaacacta gtgcttttga ttttagcggc gttacagata aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt ggtggttaca 240  
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
cgcattggtg tcgttagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360  
tt 362

<210> 212  
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<212> DNA  
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<220>  
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<400> 212  
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aaagtgaatg gccatagcgc tcatttttaa aatattgatg ccacaaagag cgataacggg 120  
ctaaacacta ggcgttttga tttgagtggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttaca 240  
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
cgcattggtg tcgttagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360  
tt 362

<210> 213  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
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<400> 213  
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aaagtgaatg gccatagcgc tcatttttaa aatattgatg ccagtaagag cgataatggt 120  
ctaaacacta gtgcttttga tttgagcggc gttacagaca aagtcaatat caacaagctc 180  
actacagctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttacg 240  
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg agatcaatcg 300  
cgcattggtg tcgttagttt gcaaactggc tatagcccgg cctattctgg gggcgttact 360  
tt 362

<210> 214  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 214  
gtggatgctc atacagctta ttttaatggc aatattttatc tgggaaaatc cacgaattta 60  
aaagtgaatg gccatagcgc tcatttttaa aatattgatg ccactaagag cgataatggt 120

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ctaaacacta gcgcttttga tttgagcggc gttacaaaca aggtcaatat caacaagctc 180
actacagctg ccactaatgt gtccattaaa aacttttgaca ttaaggaatt agtgggttacg 240
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgatcaatcg 300
cgcattggtg tcgttagttt gcaaactggc tatagcccgg cctattcttg gggcgttact 360
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<210> 215
<211> 362
<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori vacA nucleic acid sequence

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<400> 215
gtggatgctc atacggctaa ctttaatggc aatgtttatc tgggaaaatc cacgaattta 60
agagtgaatg gccatagcgc tcattttaaa aatattgatg ccagtaagag cgataacggg 120
ctaaacacta gcgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacattaaa aacttttgaca ttaaggaatt ggtgggttaca 240
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattggtg tcgttagttt gcaaacggga tatagcccgg cctattcttg gggcgttact 360
tt

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<210> 216
<211> 362
<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori vacA nucleic acid sequence

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<400> 216
gtggatgctc atacagctta ttttaatggc aatgtttatc tgggaaaatc cacgaattta 60
agagtgaatg gccatagcgc tcattttaaa aatattgatg ccagcaagag cgataacggg 120
ctaaacacta gcgcttttga ttttagcggc gttacagata aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacattaaa aacttttgaca ttaaggaatt agtgggttaca 240
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattggtg tcgtgagttt gcaaacggga tatagcccgg cctattcttg gggcgttact 360
tt

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<210> 217
<211> 362
<212> DNA
<213> Artificial Sequence

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<220>
<223> Helicobacter pylori vacA nucleic acid sequence

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<400> 217
gtggatgctc atacagctta ttttaatggc aatgtttatc tgggaaaatc cacgaattta 60
agagtgaatg gccatagcgc tcattttaaa aatattgatg ctagtaagag cgataacggg 120
ctaaacacta gcgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacgttaaa aacttttgaca ttaaggaatt agtgggttaca 240
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattggtg tcgtgagttt gcaaacggga tatagcccag cctattcttg gggcgttact 360
tt

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<210> 218
<211> 362
<212> DNA
<213> Artificial Sequence

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<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 218

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agagtgaatg gccatagcgc tcatttttaaa aatattgatg ccagcaagag cgataacggg 120
ctaaacacta gcgcttttga tttcagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacgttaaa aactttgacg ttaaggaatt ggtgggttaca 240
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattgggtg tcgtgagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360
tt                                                                                   362
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<210> 219

<211> 362

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 219

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gtggatgctc atacagctta ttttaatggc aatattttatc tgggaaaatc cacgaattta 60
agagtgaatg gccatagcgc tcatttttaaa aatattgatg ccagcaagag cgataacggg 120
ctaaacacta gcacttttga ttttagcggc gttacagata aagtcaatat caacaagctc 180
actacagctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt agtgggttaca 240
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattgggtg tcgttagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360
tt                                                                                   362
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<210> 220

<211> 362

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 220

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gtggatgctc atacagctta ttttaatggc aatattttatt tgggaaaatc cacgaattta 60
agagtgaatg gccatagcgc tcatttttaaa aatattgatg ccagtaagag cgataacggg 120
ctaaacacta gcgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt agtgggttaca 240
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300
cgcattgggtg tcgttagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360
tt                                                                                   362
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<210> 221

<211> 362

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 221

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gtggatgctc atacagctta ttttaatggc aatattttatt tgggaaaatc cacgaattta 60
agagtgaatg gccatagcgc tcatttttaaa aatattgatg ccagtaagag cgataacggg 120
ctaaacacta gtgcttttga ttttagcggc gttacagata aagtcaatat caacaagctc 180
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt ggtgggttaca 240
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300
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cgcattggtg tcgtagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360  
tt 362

<210> 222  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 222  
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agattgaatg gccatagcgc tcattttaaa aatattgatg ccagtaagag cgataacggg 120  
ctaaacacta gcgctttgga ttttagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt ggtggttaca 240  
acccgagttc agagtttttg gcaatactct atttttggcg aaaatatagg cgataagtcg 300  
cgcattggtg tcgtagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360  
tt 362

<210> 223  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 223  
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agagtgaatg gccatagcgc tcattttaaa aatattgatg ccacaaagag cgataacggg 120  
ctaaacacta gcactttgga tttgagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttacg 240  
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtc 300  
cgcattggtg tcgtgagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360  
tt 362

<210> 224  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 224  
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agagtgaatg gccatagcgc tcattttaaa aatattgatg ccacaaagag cgataacggg 120  
ctaaacatta gcactttgga ttttagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttaca 240  
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtc 300  
cgcattggtg tcgtagttt gcaaacggga tatagcccgg cctattctgg gggcgttact 360  
tt 362

<210> 225  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 225  
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agagtgaatg gccataacgc tcatttttaaa aatattgatg ccagtaagag cgataacggg 120  
ctaaacacta gcacttttga tttgagcggc gttacagaca aagtcaatat caacaagctc 180  
actacagctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtgggttacg 240  
accctgtgtc agagtttttg gcaatacact atttttggcg aaaatatagg tgataagtct 300  
cgcattggtg tcgttagttt gcaaacggga tatagcccg cctattcttg gggcgttact 360  
tt 362

<210> 226  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
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<400> 226  
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agagtgaatg gccatagcgc tcatttttaaa aatattgatg ccagtgaagag cgataacggg 120  
ctaaacacta gcgcttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt ggtgggttacg 240  
accctgtgtc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
cgcattggtg tcgttagttt gcaaacggga tgcgcccgg cctgttcttg gggcgttact 360  
tt 362

<210> 227  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
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<400> 227  
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agagtgaatg gccatagcgc tcatttttaaa aatattgatg ccagtaagag cgataacggg 120  
ctaaacacta gcgytttga ttttagcggc gttacagaya aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacrtaaa aactttgaya ttaaggaatt ggtgggttaca 240  
acccgagttc aaagtttttg gcaatacact atttttggcg aaaatatagg cgatmagtct 300  
cgcattggtg tcgttagttt gcaaacggga tatagccrg cctattcttg gggcgttact 360  
tt 362

<210> 228  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 228  
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agagtgaatg gccatagcgc tcatttttaaa aatattgatg ccacaaagag cgataatggt 120  
ataaacacta gcacttttga tttgagcggc gttacagaca aggtcaatat caacaagctc 180  
attacagctt ccactaatgt gaacattaaa aactttgaca ttaaggaatt ggtgggttaca 240  
accctgtgtc aaagtttttg gcaatacact atttttggcg aaaatatagg cgataagtct 300  
cgcattggtg tcgttagttt gcaaacggga tatagcccg cctattcttg gggcgttact 360  
tt 362

<210> 229  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 229  
gtggatgctc atacgggctaa ctttaatggc aatattttatc tgggaaaatc cacgaattta 60  
agagtgaatg gccatagcgc tcatttttaa aatattgatg ccagcaagag cgataacggg 120  
ctaaacacta gcaccttgga ttccagtggc gttacagaca aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacgttaaa aactttgata ttaaggaatt ggtggttaca 240  
acccgagttc agagttttgg gcaatacact atttttggcg aaaatatagg cgataagtcg 300  
cgcattggtg tcgtgagttt gcaaacggga tatagcccag cttattctgg gggcggttact 360  
tt 362

<210> 230  
<211> 362  
<212> DNA  
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<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 230  
gtggatgctc atacgggctaa ctttaatggc aatattttatt tgggaaaatc cacgaatttg 60  
agagtgaatg gccatagcgc tcatttttaa aatattgatg ccagtaagag cgataacggg 120  
ctaaacacta gcgctttgga ttttagcggc gttacagaca aagttaatat caacaagctc 180  
actacatctg ccactaatgt gaacgttaaa aactttgaca ttaaggaatt ggtggttaca 240  
acccgagttc aaagttttgg gcaatacact atttttggcg aaaatatagg cgataagtc 300  
cgcattggtg tcgtgagttt gcaaacggga tatagccctg cttattctgg gggcggttact 360  
tt 362

<210> 231  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 231  
gtggatgctc atacagctta ttttaatggc aatattttatc tgggaaaatc cacgaattta 60  
agagtgaatg gccatagcgc tcatttttaa aatattgatg ccagtaagag cgataacggg 120  
ctaaacacta ccactttgga ttccagcggc gttacagata aagtcaatat caacaagctc 180  
actacatctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt agtggttaca 240  
acccgagttc agagttttgg gcaatacact atttttggcg aaaatatagg cgataagctg 300  
cacattggtg tcgtgagttt gcaaacggga tatagcccag cctattctgg ggggcttact 360  
tt 362

<210> 232  
<211> 362  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 232  
gtggatgctc atacagctta ttttaatggc aatattttatc tgggaaaatc cacgaattta 60

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aaagtgaatg gccatagcgc tcatttttaa aatattgatg ctagtaagag cgataacggg 120
ctaaacacta gcgcttttga tttgagcggc gttacaaaca aggtcaatat caacaagctc 180
actacagctg ccactaatgt gaacattaaa aactttgaca ttaaggaatt ggtggttaca 240
acccgcgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgataagtcg 300
cgcattggtg tcgttagttt gcaaactggc tatagcccg cctattcttg gggcgttact 360
tt

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<210> 233  
 <211> 362  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Helicobacter pylori vacA nucleic acid sequence

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<400> 233
atggatgctc atacagctta ttttaatggc aatatttatc tgggaaaatc cacgaattta 60
aaagtgaatg gccatagcgc tcatttttaa aatattgatg ccactaagag cgataatggt 120
ctaaacacta gcgcttttga tttgagcggc gttacaaaca aggtcaatat caacaagctc 180
actacagctg ccactaatgt gtccattaaa aactttgaca ttaaggaatt agtggttacg 240
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgatcaatcg 300
cgcattggtg tcgttagttt gcaaactggc tatagcccg cctattcttg gggcgttact 360
tt

```

<210> 234  
 <211> 362  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Helicobacter pylori vacA nucleic acid sequence

```

<400> 234
gtggatgctc atacagctta ttttaatggc aatatttatc tgggaaaatc cacgaattta 60
aaagtgaatg gccatagcgc tcatttttaa aatattgatg ccactaagag cgataatggt 120
ctatacacta gcgcttttga tttgagcggc gttacaaaca aggtcaatat taacacgctc 180
actacagctg ccactaatgt gtccattaaa aactttgaca ttaaggaatt agtggttacg 240
acccgtgttc agagtttttg gcaatacact atttttggcg aaaatatagg cgatcaatcg 300
cgcattggtg tcgttagttt gcaaactggc tatagcccg cctattcttg gggcgttact 360
tt

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<210> 235  
 <211> 362  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Helicobacter pylori vacA nucleic acid sequence

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<400> 235
gtggatgcc atacgatcaa ttttaatggc aatatgtatt tgggaagatt tacgcattta 60
aaagtgaatg gtcatacagc caatttttaa gatattgatg ccagcaagg tagaaatggt 120
atcgacacca ccatttttga ttttagcggc gttacaaaca aggtcaatat caacaagctc 180
accacagctg ccactaatgc ggccattaaa aattttgaca ttaaggaatt ggttggtaca 240
accaatgttt tgagtgtggg gaaatacact gattttaccg aagatatagg cgatcaatcc 300
cgcattggta tcgtgcggtt gcaaattggga tatagcccg cctattcttg gggcgttact 360
tt

```

<210> 236  
 <211> 362  
 <212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 236

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gtggatgccc atacgatcaa ttttaatggc aatatgtatt tgggaagatt cacgcattta 60
aaagtgaatg gtcatacagc caattttaaa gatattgatg ccagcaaggg tagaaatggg 120
atcgacacca ccatttttga ttttagcggc gttacaaaca aggtcaatat caacaagctc 180
accacagctg ccactaatgc ggccattaaa aattttgaca ttaaggaatt gggtgttaca 240
accaatgttt tgagtgtggg gaaatacact gattttaccg aagatatagg cgatcaatcc 300
cgcattggta tcgttagttt gcaaacggga tatagcccgg cctattcttg gggcgttact 360
tt
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<210> 237

<211> 362

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 237

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gtggatgccc atacgatcaa ttttaatggc aacatgtatt tgggaagatt cacgcattta 60
aaagtgaatg gccatacagc caattttaaa gatattgatg ccagcaaggg tagaaatggg 120
atcgacacca ctatttttga ttttagcggc gttacagaca aagtcaatat caacaagctc 180
actacagctg ccactaatgt gtccattaaa aactttgaca ttaaggaatt gggtgttaca 240
accaatgttt tgagtgtggg gaaatacact gattttaccg aagatatagg cgatcaatcg 300
cacattgggtg tcgttagttt gcaaactggc tatagcccgg tctattcttg gggcgttact 360
tt
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<210> 238

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 238

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gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aggtaaggct aatatcaaca agctcattac ggcttccact 120
aatgtggccg ctaaaaactt caacattaat gaattgattg ttaaaaccaa tgggggtgagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcactag gtcaatctat tctggcgggtg ttaaattt 288
```

<210> 239

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 239

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gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aggtaaggct aatatcaaca agctcatcac agcttccact 120
aatgtggccg ttaaaaaactt caacattaat gaattgattg ttaaaaccaa tgggtgtgagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg ttaaattt 288
```



<210> 240  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 240  
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60  
ttagatttta gtggtgttac aggtaaggtc aatatcaaca agctcatcac agcttccact 120  
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tgggataagt 180  
gtgggggaat acactcattt tagcgaagat ataggaagtc aatcgcgcat caataccgtg 240  
cgtttggaat ctggcactag atcaatcttt tctgggggtg ttaaattt 288

<210> 241  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 241  
gtggatgctc atacagctaa ttttaaaggt attgatacgg gcaatggtgg tttcaacacc 60  
ttagatttta gtggcgttac agacaaggtc aatatcaaca agctcattac agcttccact 120  
aatgtggcca ttaaaaactt caacattaat gaattgttgg ttaagaccaa tggggtgagc 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240  
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288

<210> 242  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 242  
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60  
ttagatttta gtggcgttac agacaaggtc aatatcaaca agctcattac agcttccact 120  
aatgtggcca ttaaaaactt caacattaat gaattggttg ttaagaccaa tggggtgagt 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caacaccgtg 240  
cgtttggaat ctggcactag gtcaatctat tctgggggtg ttaaattt 288

<210> 243  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 243  
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60  
ttagatttta gtggtgttac aggtaaggtc aatatcaaca agctcatcac ggcttccact 120  
aatgtggccg ttaaaaacaa caacattaat gaattggtgg ttaaaaccaa tgggataagt 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240  
cgtttggaat caggcactag gtcaatcttt tctgggggtg tcaaattt 288

<210> 244

<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 244  
gtggatgctc atacagctaa ttttaaaggt attgatactg gtaatggtgg tttcaacacc 60  
ttagatttta gtggtgttac aaacaaagtc aatatcaaca agctcattac agcttccact 120  
aatgtggccg ttaaaaactt caacattaat gaattggtgg ttaagattaa tggggtgagt 180  
gtgggggaat acacttattt tagcgaagat ataggcagtc aatcgcgcat caacaccgtg 240  
cgtttgga aa ctggcactag gtcaatctat tctggcgggtg tttaaattt 288

<210> 245  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 245  
gtggatgctc atacagctaa ttttaaaggt attgatactg gtaatggtgg tttcaacacc 60  
ttagattttca gtggtgttac agacaaggtc aatatcaaca agctcattac agcttccact 120  
aatgtggcca ttaaaaactt caacattaat gaattggtgg ttaaaaccaa tgggtataagc 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caacaccgtg 240  
cgtttgga aa ctggcactag gtcaatctat tctggcgggtg tttaaattt 288

<210> 246  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 246  
gtggatgctc atacagctaa ttttaaaggt attgatactg gtaatggtgg tttcaacacc 60  
ttagattttca gtggtgttac agacaaggtc aatatcaaca agctcattac agcttccact 120  
aatgtggcca ttaaaaactt caacattaat gaattggtgg ttaaaaccaa tgggtataagc 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240  
cgtttgga aa ctggcactag gtcaatctat tctggcgggtg tttaaattt 288

<210> 247  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 247  
gtggatgccc atacagctaa ttttaaaggt attgatactg gtaatggtgg tttcaacacc 60  
ttagattttca gtggcggttac aaacaaagtc aatatcaaca agctcattac agcttccact 120  
aatgtggcca ttaaaaactt caacattaat gaattggtgg ttaaaaccaa tgggtataagc 180  
gtgggggaat acactaattt tagcgaagat ataggcagtc aatcgcgcat caacaccgtg 240  
cgtttgga aa ctggcactag gtcaatctat tctggcgggtg tttaaattt 288

<210> 248  
<211> 288

<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 248  
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60  
ttagatttta gtggtgttac aggtaaggtc aatatcaaca agctcatcac agcttccact 120  
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tggggtgagt 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240  
cgtttgga aa ctggcactag gtcaatctat tctggcggtg ttaaattt 288

<210> 249  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 249  
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60  
ttagatttta gtggtgttac aggtaaggtc aatatcaaca agctcatcac agcttccact 120  
aatgtggccg ctaaaaactt caacattaat gaattgattg ttaaaaccaa tggggtgagt 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240  
cgtttgga aa ctggcactag gtcaatctat tctggcggtg ttaaattt 288

<210> 250  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 250  
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60  
ttagatttta gtggtgttac aggtaaggtc aatatcaaca agctcatcac agcttccact 120  
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tgggtgtgagt 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caacaccgtg 240  
cgtttgga aa ctggcactag gtcaatctat tctggcggtg ttaaattt 288

<210> 251  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Helicobacter pylori vacA nucleic acid sequence

<400> 251  
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60  
ttagatttta gtggtgttac aggtaaggtc aatattaaca agctcattac ggcttccact 120  
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tggggtgagt 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240  
cgtttgga aa ctggcactag gtcaatcttt tctgggggtg ttaaattt 288

<210> 252  
<211> 288  
<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 252

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gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgtgac aggtatagtc aatatcaaca agctcatcac agcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tggggtgagc 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
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<210> 253

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 253

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gtggatggtc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aggtaaggtc aatatcaaca agctcataac ggcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tgggtgtgagt 180
gtgggggaat acacttattt tagcgaagat ataggcagtc aatcgcacat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 254

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 254

```
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aggtaaggtc aatatcaaca agctcattac ggcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tgggtgtgagt 180
gtgggggaat acacttattt tagcgaagat ataggcagtc aatcgcacat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 255

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 255

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gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac agacaaagtc aatatcaaca agctcatcac agcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tggggtgagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcaccag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 256

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 256

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gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac agacaaagtc aatatcaaca agctcattac ggcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tggggtgagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 257

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 257

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gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac agacaaagtc aatatcaaca agctcattac agcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattggttg ttaaaaccaa tggggtgagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcacat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 258

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 258

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gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aaacaaggtc aatatcaaca agctcattac ggcttcact 120
aatgtggcca ttaaaaactt caacattaat gaattgattg ttaaaaccaa tgggatgagc 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 259

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 259

```
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aaacaaggtc aatatcaaca agctcattac agcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tggggtgagc 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 260

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 260

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gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aaacaaggct aatatcaaca agctcattac ggcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattgattg ttaaaaccaa tggggtgagc 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 261

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 261

```
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttggatttta gtggcggttac agacaaagtc aatatcaaca agctcattac agcttcact 120
aatgtggcca ttaaaaactt caacattaat gaattgttgg ttaagaccaa tggggtgagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caacaccgtg 240
cgtttagaaa ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 262

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 262

```
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aggtaaggct aatatcaaca agctcattac ggcttcact 120
aatgtggccg ttaaaaactt caacattaat gaattgttgg ttaagaccaa tggggtgagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 263

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 263

```
gtggatgctc atacagctaa ttttaaaggt attgatacgg gtaatggtgg tttcaacacc 60
ttagatttta gtggtgttac aggtaaggct aatatcaaca agctcattac ggcttcact 120
aatgtagccg ttaaaaactt caacattaat gaattgttgg ttaagaccaa tggggtgagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caacaccgtg 240
cgtttggaat ctggcactag gtcaatcttt tctgggggtg tcaaattt 288
```

<210> 264

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 264

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gtggatggtc atacagctaa ttttaaaggt attgatacgg gtaatgggtg tttccacacc 60
ttagatttta gtggtgttac aggtaaggtc catatccaca agctcattac ggcttccact 120
aatgtggccg ttaaaaactt ccacattaat gaattgattg gtaaaaccaa tgggataagt 180
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240
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<210> 265

<211> 288

<212> DNA

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<220>

<223> Helicobacter pylori vacA nucleic acid sequence

<400> 265

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aatgtggcca ttaaaaactt caacattaat gaattgttgg ttaaaaccaa tgggataagt 180
gtgggggaat acactaattt tagcgaagat ataggcaatc aatcgcgcat caacaccgtg 240
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<210> 266

<211> 288

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<400> 266

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aatgtggccg ttaaaaactt caacattaat gaattgttgg ttaaaaccaa tgggataagt 180
gtgggggaat acactaattt tagcgaagat ataggcaatc aatcgcgcat caacaccgtg 240
cgtttggaat ctggcactag gtcaatctat tctgggggtg tttaaattt 288
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<210> 267

<211> 288

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<400> 267

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gtgggggaat acactaattt tagcgaagat ataggcaatc aatcgcacat caacaccgtg 240
cgtttagaaa ctggcactag gtcaatctat tctgggggtg ttaagttt 288
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aatgtggccg ttaaaaactt caacattagt gaattggtgg ttaaaaccaa tgggataagt 180  
gtgggggaat acactaattt tagcggagat ataggcaatc aatcgcgcat caacaccgtg 240  
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aatgtggcca ttaaaaactt caacattaat gaattggtgg ttaaaaccaa tgggataagc 180  
gtgggggaat acactcattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240  
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aatgtggccg ttaaaaactt caacattaat gaattggtgg ttaaaaccaa tgggataagt 180  
gtgggggaat acactaattt tagcgaagat ataggcaatc aatcgcgcat caacaccgtg 240  
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<220>  
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aatgtggccg ttaaaaactt caacattaat gaattggtgg ttaaaaccaa tgggataagt 180  
gtgggggaat acactaattt tagcgaagat ataggcagtc aatcgcgcat caataccgtg 240  
cgtttagaaa ctggcaccag gtcaatctat tctgggggtg ttaagttt 288

<210> 272  
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<220>  
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aatgtggcca ttaaaaactt caacattaat gaattgttg ttaaaaccaa tgggataagt 180  
gtgggggaat acactaattt tagcgaagat ataggcaatc aatcgcgcat caataccgtg 240  
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aatgtggccg ttaaaaactt caacattaat gaattgttg ttaaaaccaa tgggataagt 180  
gtgggggaat acactaattt tagcgaagat ataggcaatc aatcgcgcat caacaccgtg 240  
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<220>  
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aatgtggccg ttaaaaactt caacattaat gaattgttg ttaaaaccaa tgggataagt 180  
gtgggggaat acactaattt tagcgaagat ataggcaatc aatcgcgcat caacaccgtg 240  
cgtttagaaa ctggcactag gtcaatctat tctgggggtg ttaaattt 288

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<220>  
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<400> 275  
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aatgtggcca ttaaaaattt caacattaat gaattgttg ttaaaaccaa tgggataagt 180  
gtgggggaat acactaattt tagcgaagat ataggcagtc aatcgcgcat caacaccgtg 240  
cgtttagaaa ctggcactag gtcaatctat tctgggggtg ttaagttt 288

<210> 276  
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<400> 276

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aatgtggcca	ttaaaaactt	caacattaat	gagttggtgg	ttaaaaccaa	tgggataagt	180
gtgggggaat	acactaattt	tagcgaagat	ataggcaatc	aatcgcgcat	caacaccgtg	240
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<220>  
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<210> 279  
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<400> 279	
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<400> 280	
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